

Serial No. 09/830,380
Docket No. BREV 13186
Amendment C under Rule 116

REMARKS

While it is believed the presently pending claims adequately define over the art, independent claims 14, 15 and 20 all have been amended to stress that the thin layer material consists essentially of amorphous hafnium oxide having a density less than 8 gm/cm^3 . This is nowhere taught in nor suggested by the applied art.

In rejecting the claims as obvious from Ando et al. (U.S. Patent No. 5,399,435) in view of Lazarov et al. (U.S. Patent No. 5,670,248) and further in view of Floch et al. (U.S. Patent No. 5,623,375), the Examiner takes the position that "Ando teaches an amorphous hafnium oxide (layer) on a glass at col. 1, lines 10-15, col. 2, lines 20-40 and col. 3, lines 15-23. Such a thin film may be included in a stack of thin layers ... which may be any optical component such as a mirror ... or camera lens ... (col. 1, lines 10-16)." (underlining added for emphasis).

The Examiner's characterization of Ando et al. is not well based. In col. 1, lines 10-16, Ando explains that it is known to use amorphous oxide film for mirrors or lenses. No particular oxide is mentioned at this stage. He then goes on to mention Ag, Al or Cr, Ti, Tin or Zr (col. 1, lines 16-38). And, in discussing his invention, Ando et al. explains at col. 2, lines 24-28, that it "provides an amorphous oxide film composed essentially of an oxide containing at least one member selected from the group consisting of ... Hf ... and at least one member selected from the group consisting of B and Si."

Thus, it cannot be said that Ando et al. teaches the use of HfO_2 for mirrors or lenses. At best, Ando et al. teaches the use of a mix in which HfO_2 may be a member.

Applicants' independent claims 14, 15 and 20 all specify a layer "consisting essentially of amorphous hafnium oxide having a density less than 8 gm/cm^3 . As the Examiner is well

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aware, the transitional phrase "consisting essentially of" limits the scope of a claim to the specified materials and those do not materially affect the basic and novel characteristics of the claimed invention. See MPEP §2111.03. Thus, Applicants' claimed invention cannot be said to be taught by Ando et al.

It is not seen that the secondary references supply the missing teachings to Ando et al. to achieve or render obvious the claimed invention. In the rejection, the Examiner characterizes Lazarov et al. as teaching a material having the formula MN_xO_y where x and y are between 0.1 and 1.7 (col. 2, lines 65-66) that may be present in amorphous form (col. 3, line 35). It is acknowledged that M may be Hf. However, it is maintained that such a material cannot be HfO_2 .

In the Action, the Examiner states that Lazarov et al. teaches MO_2 (that can be HfO_2) "as a suitable component in thin film deposition" and states "hence the compound (HfO_2) is taught having a density less than 8 g/cm^3

Even assuming *arguendo* that HfO_2 can be present in the void of the material of Lazarov et al. does not mean that HfO_2 has the density of the whole material.

The mass density of a mix is necessarily an average mass density, and in the case of Lazarov et al., the density is low because there are many voids.

The fact that the material of the invention of Lazarov et al. "... formed as a thin layer, can be coated by an additional thin layer ... of ... HfO_2 " (col. 5, line 12 cited by the Examiner) does not mean that the coating layer has the same density as the invented material.

Thus, Lazarov et al. does not supply the missing teachings to Ando et al. to achieve or render obvious the claimed invention.

HAYES SOLOWAY P.C.

130 W. CUSHING ST.
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

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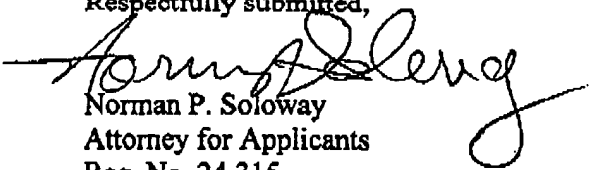
Moreover, Floch et al. does not supply the missing teachings to Ando et al. and Lazarov et al. to achieve or render obvious any of the claims. Floch et al. has been cited as teaching the production of layers of metal oxides, such as hafnium and silicon, in alternating fashion in order to produce optical articles such as mirrors, and is acknowledged as so teaching. However, Floch et al. also fails to teach or suggest a layer consisting essentially of amorphous hafnium oxide having the claimed density of less than 8 gm/cm³. Thus, no combination of Ando et al., Lazarov et al. and Floch et al. reasonably could be said to achieve or render obvious any of the claims.

Pursuant to 37 CFR 1.121, a marked copy of the amended claims showing the changes made therein accompanies this Amendment.

The foregoing Amendment makes no claim changes that would require further search or consideration by the Examiner. Thus, entry of the foregoing Amendment, and allowance of the Application are respectfully requested.

In the event there are any fee deficiencies or additional fees are payable, please charge them (or credit any overpayment) to our Deposit Account Number 08-1391.

Respectfully submitted,


Norman P. Soloway
Attorney for Applicants
Reg. No. 24,315

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I hereby certify that this correspondence is being sent via facsimile to EXAMINER TAMRA DICUS, at the United States Patent and Trademark Office at facsimile number (703) 872-9311, on May 27, 2003 from Tucson, Arizona.

By 

NPS:nm

HAYES SOLOWAY P.C.

130 W. CUSHING ST.
TUCSON, AZ 85701
TEL. 520.882.7623
FAX. 520.882.7643

175 CANAL STREET
MANCHESTER, NH 03101
TEL. 603.668.1400
FAX. 603.668.8567

MARKED AMENDED CLAIMS

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Marked Claims - Amendment C under Rule 116**MARKED CLAIMS SHOWING CHANGES MADE:**

14. (Amended) A thin layer material of hafnium oxide consisting essentially of amorphous hafnium oxide having a density less than 8 gm/cm^3 .
15. (Amended) A stack of thin layers, comprising at least one layer consisting essentially of amorphous hafnium oxide having a density less than 8 gm/cm^3 .
20. (Amended) An optical component having on at least one surface at least one layer consisting essentially of amorphous hafnium oxide having a density less than 8 gm/cm^3 .